

# REMARKS

## Status of the Claims:

Claims 1, 37, and 38 have been amended. Claims 51-52 have been added. After amending the claims as set forth above, claims 1-52 are now pending in this application.

## I. Claim Rejections – 35 U.S.C. § 103 – Choi, Cano, and Gibson

Claims 1-50 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Choi (US 2003/0014246), Cano et al. (“Voice Morphing System for Impersonating in Karaoke Applications”) (Cano), and Gibson et al. (US 6,336,092) (Gibson). These rejections are respectfully traversed in view of the claims as amended herein.

Independent claim 1 recites a vocoder system comprising:

formant detection means for analyzing a first musical tone signal to detect formant characteristics of the first musical tone signal;

musical tone signal input means for inputting a second musical tone signal that corresponds to specified pitch information;

division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed;

setting means for setting modulation levels at the fixed center frequency of each of the frequency bands, relative to other frequencies of each of the frequency bands, based on the formant characteristics and formant control information with which the formant characteristics detected by the formant detection means are changed; and

modulation means for modulating a level of a signal of each of the frequency bands based on the modulation level set in the setting means.

(Similar features are found in independent claims 37 and 38. *See also* new claim 52.)

Claim 1 is neither taught, suggested, nor rendered predictable by the Choi, Cano, and Gibson references, alone or in the combination suggested by the Examiner. In particular, claim 1 recites a vocoder system that includes, among other features,

*formant detection means for analyzing a first musical tone signal . . . ;*

*musical tone signal input means for inputting a second musical tone signal . . . ;*

*division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed;*

*setting means* for setting *modulation levels* at the fixed center frequency of each of the frequency bands, **relative to other frequencies of each of the frequency bands** . . . ; and

*modulation means* for modulating *a level of a signal* of each of the frequency bands based on the modulation level . . . .

Thus, a setting means sets modulation levels at the fixed center frequency **relative to other frequencies** for each of the frequency bands. The Choi, Cano, and Gibson references, alone or in the combination suggested by the Examiner does not teach, suggest, or render predictable a vocoder system, as recited in claim 1, including these features.

According to the Examiner, the Choi reference discloses:

a vocoder system comprising: formant detection means for analyzing a first tone signal to detect formant characteristics of the first tone signal ("voice signal of the subscriber... detect the spectrum parameter", paragraph 46; "spectrum parameter... are detected", paragraph 47; where the spectrum of a signal comprises, among other things, the formants of a voice) tone signal input means for inputting a second tone signal that corresponds to specified pitch information ("selects the kind of the effect. .. converts the spectrum parameter... with reference to the loaded spectrum parameter... conversion of the spectrum parameter... height of voice", paragraph 47) setting means for setting modulation levels based on the formant characteristics and formant control information with which the formant characteristics detected by the formant detection means are changed ("selects the kind of the effect... converts the spectrum parameter... with reference to the loaded spectrum parameter... conversion of the spectrum parameter... height of voice", paragraph 47; "modulating", paragraph 38) modulation means for modulating a level of a signal based on the modulation level set in the setting means ("modulating", paragraph 38).

*See* p. 11 l. 13 to p. 12 l. 4 of the Office Action dated October 1, 2009 (*Office Action*).

However, as acknowledged by the Examiner, "Choi fails to teach the tone signals are musical tone signals." *See* p. 12 l. 5 of *Office Action*.

As a result, the Examiner cites the Cano reference, which according to the Examiner "teaches the tone signals are musical tone signals ("target singer", Introduction)." *See* p. 12 ll. 6-7 of *Office Action*. However, as acknowledged by the Examiner,

Choi, in view of Cano, fail to teach division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed, where the modulation levels are set at the

fixed center frequency of each of the frequency bands, and where modulating the level of a signal modulates levels of each of the frequency bands.

*See* p. 12 ll. 12-16 of *Office Action*. As a result, the Examiner cites the Gibson reference, which according to the Examiner:

suggests division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed, where the modulation levels are set at the fixed center frequency of each of the frequency bands, and where modulating the level of a signal modulates levels of each of the frequency bands ("signal is split into two equal-width frequency bands... gain compensation ... transformed ", col. 9, lines 44-65; "summing a gain-compensated high frequency signal and the transformed low-frequency component", col. 9, line 65 - col. 10, line 2; "source and target voice signals", col. 7, lines 17-28; where, to determine the target voice characteristics and the necessary transformations, an analysis of the target voice signals in the corresponding frequency bands is obvious/necessary).

*See* p. 12 l. 17 to p. 13 l. 4 of *Office Action*.

However, the Gibson reference does not address the distinction between claim 1 and the Choi and Cano references. The Gibson reference fails to disclose setting modulation levels at the fixed center frequency **relative to other frequencies** for each of the frequency bands. Indeed, the Gibson reference discloses changing values at other frequencies as well. *See* col. 7 ll. 22-29 (disclosing five methods of spectral modification for "scaling the spectral envelope [of a user's voice] to more closely match the timbre of the target vocal signal"); *see, e.g.*, col. 7 ll. 30-50 (applying a conformal mapping to the transfer function of a digital filter); col. 7 ll. 51-57 (finding singularities (i.e., poles and zeros) of a digital filter transfer function and then modifying the location of these singularities to generate a new digital filter having the desired spectral characteristics); col. 8 ll. 12-15 (shifting a spectral envelope in frequency by a certain percentage); col. 8 ll. 18-23 (manipulating a frequency-transformed representation of a signal); col. 8 ll. 24-28 (decomposing a digital filter transfer function into multiple lower-order sections and then modifying the lower-order sections using previously-described methods).

As such, the Gibson reference does not disclose setting modulation levels at the fixed center frequency **relative to other frequencies** for each of the frequency bands.

Furthermore, the Examiner noted that if the center frequency's modulation level is set relative to other frequencies, claim 1 would be distinguished from the Gibson reference. *See* p. 3 l. 17 and p. 6 ll. 11-12 of *Office Action*.

To establish a prima facie obviousness of a claim invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981 (CCPA 1974). Because none of the references disclose or suggest the recited features, there can be no prima facie obviousness by seeking to combine these references.

Therefore, for at least the reasons above, the Choi, Cano, and Gibson references do not anticipate, suggest, or render predictable independent claims 1, 37, and 38. Claims 2-36, and 41-50 depend from claim 1 (directly or indirectly) and are believed to be allowable for at least the same reasons as claim 1 is believed to be allowable. Claims 39 and 40 depend from claim 38 (directly or indirectly) and are believed to be allowable for at least the same reasons as claim 38 is believed to be allowable. Accordingly, the rejections of claims 1-50, as amended herein, are respectfully traversed.

#### **IV. New Claims:**

New claims 51-52 are added to further protect additional features of the present invention.

Claim 51 generally recites, among other features, the setting means for setting modulation levels only at the fixed center frequency of each of the frequency bands based on the formant characteristics and formant control information with which the formant characteristics detected by the formant detection means are changed. This claim is supported by the original application, for example, in paragraph [0051]. This claim is not disclosed in the cited reference(s). Moreover, this claim is believed to be allowable at least for the reasons of its parent claims and/or the reasons previously discussed.

Claim 52 generally recites a vocoder system comprising: formant detection means for analyzing a first musical tone signal to detect formant characteristics of the first musical tone signal; musical tone signal input means for inputting a second musical tone signal that corresponds to specified pitch information; filtering means for dividing the second musical tune

signals into a plurality of frequency bands based on respective fixed center frequencies; setting means for setting modulation levels at the fixed center frequency of each of the frequency bands based on the formant characteristics and formant control information with which the formant characteristics detected by the formant detection means are changed; and modulation means for modulating a level of a signal of each of the frequency bands based on the modulation level set in the setting means. This claim is supported by the original application, for example, in paragraph [0048]. This claim is not disclosed in the cited reference(s). Moreover, this claim is believed to be allowable at least for the reasons of its parent claims and/or the reasons previously discussed.

**V. Conclusion:**

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to

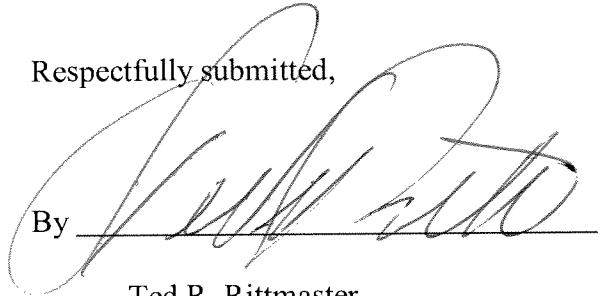
Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date

1-22-10

By

A handwritten signature in black ink, appearing to read 'Ted R. Rittmaster', is written over a horizontal line.

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